

Appl. No. : 09/881,256
Filed : June 14, 2001

Discussion of Drawing Corrections

Applicant has amended Figures 1 and 2 to clarify the position of reference signs "2A" and "2B" that are mentioned in the specification.

Status of Claims

The Examiner has rejected Claims 1-13 under 35 USC §102(b) as allegedly anticipated by Kikuchi et al. (JP 11-329083). The Examiner has rejected Claim 14 under 35 USC 103(a) as allegedly obvious over Kikuchi in view of Munakata et al. (US 6,331,677). The Examiner has also provisionally rejected Claims 1-14 under the judicially created doctrine of obviousness-type double patenting over copending Application No. 09/727,070.

Discussion of Rejections Under 35 USC §102(b)

Claims 1-13 have been rejected as anticipated by Kikuchi. The rejections to Claims 2-13 are moot in light of Applicant's cancellation of those claims.

Applicant's claims are directed to an overhead cable that is optimized for use in conditions of strong winds in combination with rainfall. See, for example, Specification page 1 lines 6-11 and page 3 lines 16-19. As noted in Applicant's Specification, overhead cables that are designed for reduced wind load often do not exhibit the same characteristics when exposed to the combined conditions of high wind and rain. The conventional overhead cable design does not exhibit a sufficient reduction of drag coefficient under conditions of strong wind and rainfall. See generally, Specification at page 1 line 12 through page 3 line 13. Applicant's Table 3 summarizes the overhead cable giving the best effects of reduction in the drag coefficient at the time of rainfall. See page 16 lines 4-7 and Table 3.

The Kikuchi reference, in contrast, is only concerned with reducing the wind load acting upon a cable in a lower wind speed zone. Kikuchi Abstract. As such, Kikuchi does not address wind load under conditions of both high wind and rain. Thus, Kikuchi addresses wind load without concern to rainfall and does not seek to optimize the cable with respect to the conditions of high wind and rain. For example, some of the cables and conditions detailed in Applicant's Table 3 (No. 5-2, 6-4, and 7-1) are not addressed or even considered in Kikuchi. Additionally, none of the rain conditions identified in Applicant's Table 3 are taught or suggested in Kikuchi.

Claim 1, as amended, recites an overhead cable that includes a diameter “in a range of 36.6 to 52 mm” and where “the depth H of each arc-shaped groove and the diameter d satisfy a condition defined by ... $0.00656 < H/d \leq 0.00761$.” Additionally, the overhead cable of Claim 1 includes “the radius R of each arc-shaped groove and the depth H satisfy a condition defined by ... $0.1412 < H/R \leq 0.1458$.” Support for the amendment can be found in the specification at Table 3, sample Nos. 5-2, 6-4, and 7-1.

Kikuchi does not teach or suggest these claimed features. All of the cables described in Kikuchi have a diameter less than or equal to 36.6 mm. Additionally, none of the cables described in Kikuchi have a ratio of H/d in the claimed range. The largest H/d number disclosed in Kikuchi is only 0.0536. Kikuchi Table 2, final entry.

Kikuchi also does not disclose or suggest any overhead cable having both the H/d range and the H/R range of the claimed overhead cable. This is because Kikuchi does not teach or discuss optimizing an overhead cable in the conditions of both high wind and rainfall. Thus, Claim 1 is believed to be allowable over Kikuchi because Kikuchi fails to teach or suggest all claim limitations. Furthermore, Applicant respectfully believes that Claim 1 is not obvious in view of Kikuchi because Kikuchi is not concerned with the same size cables or environmental conditions that give rise to the claimed invention.

Applicant respectfully requests reconsideration and allowance of Claim 1.

Discussion of Rejections Under 35 USC §103

Claim 14 has been rejected as obvious over Kikuchi in view of Munakata. Claim 14 is believed to be allowable at least for the reason that it depends from an allowable base claim. Claim 14 depends from Claim 1 that is believed to be allowable.

Discussion of Double Patenting Rejections

Applicant believes that Claim 1, as amended, is patentably distinct from Claim 6, as published, from U.S. Application No. 09/727,070 by Kikuchi. Claim 1 includes ranges for cable diameter and H/d values that are not within the scope of Claim 6 of Kikuchi. Additionally, Claim 1 includes a combination of diameter and ranges that are not obvious in light of the

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teachings in Kikuchi. Applicant respectfully requests reconsideration and withdrawal of the double patenting rejection.

CONCLUSION

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. Accordingly, amendments to the claims for patentability purposes pursuant to 35 U.S.C. §§ 102, 103 and/or 112, the reasons therefor, and arguments in support of the patentability of the pending claim set are presented above. In light of these amendments and remarks, reconsideration and withdrawal of the outstanding rejections is respectfully requested. Applicant submits that the claim limitations discussed above represent only illustrative distinctions. Hence, there may be other patentable features that distinguish the claimed invention from the prior art.

If there are any impediments to allowance of the claims that can be resolved with a telephone call, the Examiner is respectfully invited to call the undersigned. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Twice Amended) An overhead cable wherein a sectional shape of an outer circumferential surface formed by outermost members is a polygon inscribing a circle of a diameter d mm, sides of the polygon are formed as substantially flat surfaces connecting adjoining vertexes, vertexes of the polygon inscribing the circle are cut away to form arc-shaped grooves having a radius R mm and having a depth H mm from the vertexes, and the arc-shaped grooves are formed in spirals in the outer circumference of the overhead cable in a longitudinal direction of the overhead cable at predetermined pitches,

the diameter d of the overhead cable being in a range of ~~18~~ 36.6 to 52 mm,

and

the outer circumferential surface formed by the outermost members being formed ~~so that~~ by a number N of vertexes of the polygon, N being greater than 20 and equal or less than 26, ~~and the diameter d satisfy a condition defined by the following formula 1:~~

$$N = (13.0 + 0.092d + 0.0031d^2) \text{ rounded off} \quad (1)$$

the depth H of each arc-shaped groove and the diameter d satisfy a condition defined by the following formula 12:

$$0.00543d \leq H \leq 0.00865d \quad (2)$$

$$0.00656 < H/d \leq 0.00761 \quad (1)$$

and

the radius R of each arc-shaped groove and the depth H satisfy a condition defined by the following formula 23:

$$4.960H \leq R \leq 8.802H \quad (3).$$

$$0.1412 < H/R \leq 0.1458 \quad (2).$$

AMEND

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031003



Proposed Drawing Correction

FIG. 1

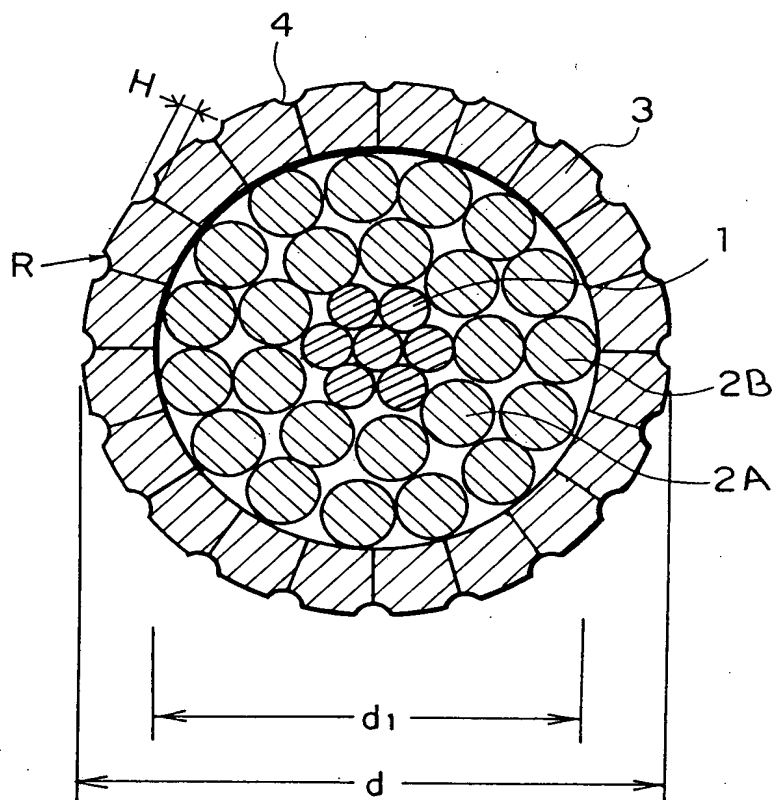


FIG. 2

